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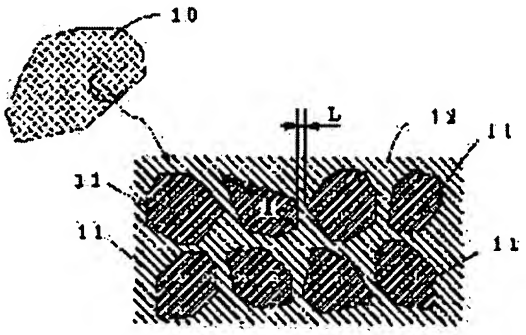
(21)Application number : 2001-258402 (71)Applicant : BRIDGESTONE CORP

(22)Date of filing : 28.08.2001 (72)Inventor : TAGUCHI JINICHI

## (54) RARE-EARTHS MAGNETIC ALLOY WITH REFINED CRYSTAL, AND RARE-EARTHS BOND MAGNET

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a rare-earths magnetic alloy powder superior in coercive force and high residual magnetic flux density, in which micro-crystallites consisting of a hard magnetic body are precipitated, and provide a rare-earths bond magnet superior in magnetic properties manufactured with the use of the magnetic powder.




SOLUTION: The rare-earths magnetic alloy 10 with refined crystallites, having great coercive force iHc, residual magnetic flux density Br, and maximum energy product (BH)Max, is obtained by means of precipitating a microcrystalline phase (a main phase 11) consisting of a soft magnetic material, which has an average length of a longer axis of the crystals of 30 nm or longer but shorter than 100 nm, and the shortest distance between the crystals of 10 nm or longer but shorter than 50 nm, in metal or a metal compound (a secondary phase 12) of non-crystalline or crystalline form, consisting of a hard magnetic body of the amorphous rare-earths alloy containing iron as a main component. The rare-earths bond magnet with a high magnetic force is obtained by means of molding the resin magnet composition, in which a fine powder of such a rare-earths magnetic alloy with fine crystallites is mixed with and dispersed in a resin binder.

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## (54) COMPOSITE MAGNETIC MATERIAL, MAGNETIC DEVICE, AND ITS MANUFACTURING METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a composite magnetic material which is highly excellent in insulation properties and magnetic characteristics to be adaptable for a reduction in the size of a transformer, a choke coil or the like or for use in a high-frequency range.

SOLUTION: The composite magnetic material is composed of soft magnetic alloy powder and an insulating binder. The composition of the soft magnetic alloy powder is represented by formulas, 1 wt.% ≤ component A≤7 wt.%, 0.05 wt.% ≤ oxygen(O)≤0.6 wt.%, 0.01 wt.% ≤ manganese(Mn) ≤ 0.2 wt.%, and residual wt.% = iron (Fe), wherein the component A contains at least one element selected out of silicon(Si), aluminum(Al), chrome(Cr), nickel(Ni), niobium (Nb), calcium(Ca), titanium(Ti), and magnesium(Mg), so that the composite magnetic material having the superior insulating and magnetic properties can be obtained.

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